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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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SUGHRUE MION ZINN MACPEAK & SEAS		EXAMINER		
2100 PENNSYLVANIA AVENUE NW		FISCHER, JUSTIN R		
WASHINGTON, DC 20037				
		ART UNIT	PAPER NUMBER	
		1733		
DATE MAILED: 04/22/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/398,006

Applicant(s)

OKAMOTO ET AL.

Examiner

Justin R Fischer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-7,24 and 25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-7,24 and 25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 30, 2004 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3-5, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farnsworth (GB 1,483,053, of record) in view of Kohno (US 5,968,295, of record) and optionally in view of Gaudin (US 5,591,284, newly cited).

Farnsworth, as best depicted in Figure 1, substantially teaches the pneumatic tire construction of the claimed invention, including a belt assembly formed of a radially innermost steel belt layer 4, a middle steel belt layer 3, and an outermost, high angled steel belt layer 2, is narrower than the radially innermost steel cord layer. In describing the axial extent of the belt assembly as a whole, Farnsworth suggests that said belt

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assembly has a maximum axial width between 90 and 110% of the axial width of the tread (Page 1, Lines 94-96). Although Farnsworth fails to depict the inclusion of tread grooves, one of ordinary skill in the art at the time of the invention would have expected the tire of Farnsworth to contain a plurality of tread grooves as is conventional in pneumatic tires and furthermore, in view of the above noted range, one would have expected the outer ply to extend outward of the outermost tread groove. As to the axial widths of the respective plies, while Farnsworth fails to expressly require the outermost ply have an intermediate width (in relation to inner and middle ply), a fair reading of Farnsworth suggests that a wide range of belt assemblies having varying widths is within the scope of Farnsworth- in particular, the reference places no criticality on which belt ply is the widest or the narrowest, as evidenced by Figures 1-3C. As such, one of ordinary skill in the art at the time of the invention would have found it obvious to form the outer ply narrower than the innermost ply and wider than the middle ply, there being no conclusive showing of unexpected results to establish a criticality for this relationship. Gaudin is optionally applied to evidence that it is known in the tire industry to stagger the ends of belt plies in order to avoid the buildup of stresses (Column 1, Lines 35-45) and furthermore, it is known in the tire industry that any of a wide number of belt arrangements having varying axial widths provide a suitable belt construction (Column 2, Lines 24-32 and Figures 6-11). It is emphasized that the belt construction of Gaudin depicted in Figures 6-11 is extremely similar to that of Farnsworth in that three steel plies are included. Lastly, regarding the compression modulus of the coating rubber, one of ordinary skill in the art at the time of the invention would have readily

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appreciated the broad range of the claimed invention (greater than **200 kgf/cm²**) as defining extensively used coating rubber compositions in similar belt plies. Kohno, for example, is directed to a similar tire construction having an outermost belt layer that can be formed of steel in which the coating rubber has a compression modulus greater than **200 kgf/mm²** in order to prevent the cords of this belt layer from moving and causing local buckling of said cord (Column 4, Lines 47-55). Thus, Kohno suggests a minimum value for the compression modulus that is **100 times greater** than that required by the claimed invention, such that one of ordinary skill in the art at the time of the invention would have readily appreciated the claimed range of "at least 200 kgf/cm²". It is further noted that applicant similarly attributes the benefits of reducing buckling fatigue to the inclusion of a coating rubber having a compression modulus of at least 200 kgf/cm² (Page 9, 2nd Paragraph). As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the coating rubber of the outermost layer of Farnsworth with a compression modulus of at least 200 kgf/cm² as such a construction is extensively used in the outermost belt plies formed of steel for the benefits detailed above, as shown for example by Kohno.

Regarding claims 1, 3-5, 24, and 25, Farnsworth depicts multiple embodiments in which the high angled layer is the outermost layer (Figures 1, 3B, and 3C). While no single embodiment depicts the high angled layer as being both narrower than the innermost layer and wider than the middle layer, it is clearly evident that Farnsworth places no criticality on the axial extent of the outer, high angled layer in relation to the inner and middle layers, only stating that the maximum axial width of the belt assembly

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(as a whole) is in the range of 90 to 110% of the tread width. The specific selection of an embodiment in which the high angled layer is wider than the middle layer and narrower than the innermost layer would have been within the purview of one of ordinary skill in the art at the time of the invention, particularly since it is well known to stagger the ends of belt plies so stresses do not buildup at the ply ends. Gaudin has been optionally applied to evidence this point and furthermore, to illustrate the use of a variety of suitable, belt configurations in regards to the width of the respective plies. In order to satisfy the claimed invention, for example, the inner layer in either Figure 3B or 3C would have to be extended beyond the outer layer or the outer layer in Figure 1 would have to be extended beyond the middle layer. Thus, since Farnsworth describes a plurality of embodiments in which the axial extent of the respective plies is axially varied and Farnsworth fails to suggest a criticality in any specific arrangement, it would have been obvious to one of ordinary skill in the art at the time of the invention to form a belt assembly as defined by the claimed invention, there being no conclusive showing of unexpected results to establish a criticality for this arrangement. **It is noted that applicant points to Pages 22 and 23 of the original disclosure for support of unexpected results; however, the original disclosure only states that the benefits of cut resistance and separation resistance result from the outermost cord layer being wider than the middle cord layer- the original disclosure fails to associate any criticality to the relationship between the outermost cord layer and the innermost cord layer. In this regard, Farnsworth depicts multiple embodiments**

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(Figures 3B and 3C) in which the outermost, high angled cord layer is wider than the middle cord layer.

Regarding claim 5, applicant requires that the cord to cord distance between the end of the middle cord layer and the adjacent outermost cord layer is greater than 0.15 times the cord to cord distance between the same end of the middle cord layer and the adjacent inner layer. A fair reading of Farnsworth as a whole suggests that the relevant distances would be approximately the same, as would be expected by one of ordinary skill in the art at the time of the invention. Thus, the cord-to-cord distance (defined by topping rubbers) between the middle cord layer the outermost cord layer would be approximately 1.0 times the cord-to-cord distance between the middle cord layer and the inner cord layer.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Farnsworth, Kohno, and Gaudin as applied in claim 1 above and further in view of Okamoto (US 5,779,828, of record).

As previously mentioned, the combination of references teaches or suggests all the limitations of claim 1. The references, however are silent with respect to the employment of an end cover rubber having a wavy surface in accordance to the limitations of the claimed invention (peak to trough distance of between 0.05 and 0.25 mm). In any event, a variety of end cover rubbers are conventionally used in the ends of breaker or belt layers to prevent "belt end separation". Okamoto describes a specific type of end cover rubber in the belt region having a wavy surface and a peak to trough distance of between 0.05 and 0.25 mm, which mimics the range outlined by the claimed

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invention (Column 8, Lines 53-61). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the specified wavy end cover rubber, as suggested by Okamoto, in the general tire construction of either one of Bourdon or Farnsworth. The use of such a wavy end cover rubber provides reinforcement in both the radial and axial direction, further reducing the occurrence of "belt end separation", which is a desirable property in all pneumatic tire constructions.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Farnsworth, Kohno, and Gaudin as applied in claim 1 above and further in view of Imamura (US 3,913,652, of record).

As previously mentioned, the combination of references teaches or suggests all the limitations of claim 1; however, the references are silent with respect to the use of end cover rubber that is joined to a widthwise outer end face of the cord layer over a full periphery of the cord layer, as depicted in Figure 11. In any event, as stated in the previous paragraph, a variety of end cover rubbers are conventionally used in the ends of breaker or belt layers to prevent "belt end separation". Furthermore, Imamura depicts multiple arrangements of conventional end cover rubbers, including an embodiment in which the end cover rubber is joined to a widthwise outer end face of the cord layer over a full periphery of the cord layer (Figure 1C). In describing the width of the end cover rubber or rubber reinforcing layer, Imamura provides multiple embodiments (Examples 4 and 5) in which the gauge of the end cover rubber is approximately 1 mm, which is well within the broad range of 0.05 to 5 mm defined by the claimed invention. As such, it would have been obvious to one of ordinary skill in the art at the time of the invention

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to employ an end cover rubber in accordance to the limitations of the claimed invention, as suggested by Imamura, in the general tire construction defined by either one of Bourdon or Farnsworth. This particular type of end cover rubber represents one of many conventional such rubbers used to prevent "belt end separation" and would have been readily appreciated by one of ordinary skill in the art.

Response to Arguments

6. Applicant's arguments filed March 30, 2004 have been fully considered but they are not persuasive. Applicant contends that Farnsworth fails to disclose or depict a belt assembly in which the outermost ply is wider than the middle ply and narrower than the innermost ply and one of ordinary skill in the art at the time of the invention would only practice the specific belt assemblies expressly disclosed or depicted by Farnsworth. Also, applicant argues that the examiner has not pointed to any prior art disclosure to support his assertion that "it is well known to stagger the ends of belt plies so stresses do not build up at the ply ends". Lastly, applicant suggests that the benefits of cut resistance and separation resistance result from the claimed belt arrangement and none of the references even hint at such a structure.

As noted in the rejection above, a fair reading of Farnsworth suggests that the axial extent of each belt ply is not critical to the tire construction of Farnsworth- Farnsworth only states that it is preferred that the high angle ply is the outermost ply since such a construction provides protection for the innermost and middle belt plies, which bear a larger load as compared to the outermost ply (Page 1, Lines 65-70). As depicted in Figures 1-3C, Farnsworth suggests multiple belt assemblies in which the

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widths of the respective belt plies are varied. In Figures 1 and 2, the outermost, high angle ply is the narrowest ply. In Figures 3B and 3C, the outermost, high angle ply is the widest ply. While the figures fail to expressly depict a construction in which the outermost ply has an intermediate width (in relation to the inner and middle plies), one of ordinary skill in the art at the time of the invention would have found it obvious in view of Farnsworth, which as noted above, places no criticality on which belt ply is widest or narrowest. The multiple belt assemblies depicted in Figures 1-3C suggest that additional belt constructions having different widths would have been well within the purview of one of ordinary skill in the art at the time of the invention. In particular, one of ordinary skill in the art at the time of the invention would not have viewed Farnsworth as being limited to the constructions expressly depicted in the figures- a more general and fair reading of Farnsworth suggests that the axial extents of the belt plies can be varied as long as they are consistent with suitable belt assemblies. The specific assembly defined by the claimed invention is recognized in the tire industry as being a suitable belt construction since it provides a "staggered construction" at the axial ends of the belt assembly, thereby eliminating the buildup of stresses as is well known in the tire industry. Gaudin has been applied in the rejection above to evidence the well-known use of "staggered constructions" in the tire industry. Furthermore, Gaudin recognizes that a large number of belt assemblies having varying axial widths are commonly used in the tire industry. Figures 6-11 depict multiple belt assemblies in which the narrowest and widest ply is varied among the innermost, middle, and outermost ply. It is noted that the belt of Gaudin, in an analogous manner to the

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claimed invention and Farnsworth, is a triangulated assembly. As such, the specific belt assembly of the claimed invention is well recognized in the tire industry and would have been obvious to one of ordinary skill in the art at the time of the invention absent any conclusive showing of unexpected results.

Regarding the benefits of cut resistance and separation resistance, applicant points to pages 22 and 23. However, upon reading this section of the original disclosure, the aforementioned benefits are attributed to the outermost ply being wider than the middle cord layer- the original disclosure fails to place any criticality on the relationship between the outermost ply and the innermost ply. In this instance, Figures 3B and 3C of Farnsworth depict embodiments in which a high angled outer layer has an axial width greater than the axial width of a low angle middle layer- one would expect the benefits of cut resistance and separation resistance to naturally flow from this construction in an analogous manner to the claimed invention.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Justin R Fischer** whose telephone number is **(571) 272-1215**. The examiner can normally be reached on M-F (7:30-4:00).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Justin Fischer

April 16, 2004


JEFF H. AFTERGUT
PRIMARY EXAMINER
GROUP 1300